Critical Measurements Program

The Critical Measurements Program (CMP) is the corporate test program for the Missile Defense Agency (MDA). The objective of CMP is to execute high fidelity experiments in realistic environments, which provides data to mitigate Ballistic Missile Defense (BMD) technical risks.

To collect the required critical data, CMP conducts a test campaign consisting of two to four launches with scenarios typical of current and projected BMD threats. Due to the high fidelity hardware and realistic scenarios in which the hardware is deployed, the CMP Office assembles an extensive suite of data collection platforms and range assets to maximize the data collection on each campaign. Each mission provides extensive radar and optical data in a wide variety of wavebands, as well as on-board instrumentation measurements, throughout the trajectory.

The CMP designs experiments to provide specific data on a chosen threat required by one or more BMD weapon system developers. Generally, the launch includes a high fidelity reentry vehicle and known or potential countermeasures. Previous experiments included balloons, decoys, liquid fuel experiments, and booster fragmentation and segmentation. These experiments support the investigation of the impact of different threats on BMD system functional performance, and provide the opportunity to evaluate current and future discrimination techniques.

Missions

CMP will execute the next campaign (CMP-4) from Wake Island into the broad ocean area in the vicinity of the Kwajalein Atoll. The campaign consists of two suborbital flight tests (CMP-4A and CMP-4B). The flights utilize an inertially guided rail-launched launch vehicle. CMP-4A and CMP-4B are currently planned for 2003.

CMP's most recent launch occurred in February 2001. The mission was executed as a risk reduction effort for the System Integration Test II and for IMPACT 98 evaluation.

Previous CMP launches occurred in 1993, 1996, and 1997. Future campaigns may include longer-range missiles. Launch vehicles and sites for these missions have not been selected.

Data Collection

Data collection addresses BMD System functional performance and algorithm robustness as well as the characterization and evaluation of the effectiveness of potential countermeasures.

CMP has included in the payload hardware, beginning with the TCMP-2 1996 launch, a Fly Away Sensor Package (FASP). This onboard sensor collects high quality infrared and visible imaging and signature data at a very close range to the complex, and then telemeters the data to remotely based recorders.

The FASP built for the third CMP campaign was improved with the addition of a second infrared camera that collected middle-wavelength infrared, long-wavelength infrared, and visible imaging data. The FASP, a data collection asset unique to the CMP, consists of off-the-shelf components, repackaged and ruggedized to survive the mission environment. It performed well during its maiden flight in July 1996. During subsequent missions, it has provided high-quality infrared and visible data of unitary missiles and the separated reentry vehicles.

Other measurement sensors (ground-based, airborne, ship-based, etc.) collect CMP data. The AEGIS, Airborne Surveillance Testbed, Defense Support Program satellites, High-Altitude Observatory, Midcourse Space Experiment, Cobra Eye, Cobra Judy, THAAD Radar and PATRIOT radar are among the mobile sensors that have collected data on CMP missions to date.

Management and Support

The MDA has designated the Space and Missile Defense Technical Center as the Executing Agent for the CMP.

The Massachusetts Institute of Technology/Lincoln Laboratory is the payload developer and participates in mission planning and sensor coordination efforts. MDA's Targets Joint Project Office provides the launch vehicle and launch services through Orbital Sciences Corporation. Teledyne Solutions, Inc., Photon Research Corporation, Coleman Research Corporation, and TRW Strategic Systems Division provide technical support.

CMP stores its data at the Missile Defense Data Center in Huntsville, Ala., along with numerous analysis products for use by Department of Defense agencies and their contractors.

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